DRAFT

EPA Guidelines for Munitions Response

EPA Office of Solid Waste and Emergency Response (OSWER)

Federal Facilities Restoration and Reuse Office (FFRRO)

24 October 2003

Table of Contents

DRAFT

EPA Guidelines for Munitions Response

EPA Office of Solid Waste and Emergency Response (OSWER)
Federal Facilities Restoration and Reuse Office (FFRRO)

1. What is the purpose of EPA's Guidelines?

These Guidelines provide direction to EPA Regional Offices overseeing munitions response actions involving military munitions and other ordnance and explosives (OE). The Guidelines build and elaborate on the joint DoD/EPA *Interim Final Management Principles for Implementing Response Actions at Closed, Transferring, and Transferred (CTT) Ranges ("the Principles"),* signed March 7, 2000. For the most part, the Guidelines address situations where the U.S. Army Corps of Engineers (USACE) or another DoD service component will be conducting the response action as the Lead Agency and the regulatory agencies will be providing oversight. The Guidelines may also be applicable when EPA or other Federal agencies have the lead in the investigation and cleanup of OE.

The discussion in this document is intended solely as guidance. The statutory provisions and EPA regulations described in this document contain legally binding requirements. This document is not a regulation itself, nor does it change or substitute for those provisions and regulations. Thus, it does not impose legally binding requirements on EPA, States, Tribes or the regulated community. This guidance does not confer legal rights or impose legal obligations upon any member of the public.

While EPA has made every effort to ensure the accuracy of the discussion in this guidance, the obligations of the regulated community are determined by statutes, regulations, or other legally binding requirements. In the event of a conflict between the discussion in this document and any statute or regulation, this document would not be controlling.

The general guidelines provided in this document may not apply to a particular situation based upon the circumstances. Interested parties are free to raise questions and objections about the substance of this guidance and the appropriateness of the application of these guidelines to a particular situation. EPA and other decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from those described in this guidance where appropriate.

This is a "living" document and may be revised periodically by EPA without public notice. EPA welcomes public input on this document at any time.

These Guidelines are meant to guide readers where explosive materials are known or believed to be present at a potential or actual location or site. EPA has issued extensive regulations, guidance, and policies on responses at chemical contamination sites, and these

Guidelines are not intended to supersede, limit or change any of those issuances. These guidelines focus instead on the unique aspects of responding to sites where explosion is an additional, or the principal threat, such as at munitions response areas and other related sites. Such areas or sites include, but are not limited to, locations such as former DoD training areas, former manufacturing plants, bombing ranges or target areas, or open burning/open detonation areas. These areas may still be under DoD control (such as a BRAC installations), may be owned by a different federal department or agency (e.g. BLM, Forest Service, FWS) or may be owned by a State or private entity.

Among the topics these Guidelines address are:

- General regulatory authorities
- Use of CERCLA authorities
- Involvement of State and Tribal environmental regulators and the public
- Explosives safety principles
- Site characterization principles
- Transfer of ranges
- Land use and institutional controls
- Enforcement principles

Readers will find EPA's interim final *Handbook on the Management of Ordnance and Explosives at Closed, Transferring, and Transferred Ranges*[1] to be a helpful companion document. The Handbook supplements these Guidelines by providing regulators and the interested public with more depth on the technical issues associated with OE response. In addition, the Handbook provides a common nomenclature to aid in the management of ordnance and explosives, including unexploded ordnance (UXO), and facilitates a common understanding of the state of the art of OE detection and response. The Handbook is updated periodically and can be found on the FFRRO munitions website at http://www.epa.gov/swerffrr/documents/munitions.htm.

2. What do we know about the current situation in the United States?

The National Defense Authorization Act for FY 2002 (P.L. 107-107) directs DoD to "develop and maintain an inventory of defense sites that are known or suspected to contain unexploded ordnance, discarded munitions or munitions constituents." DoD's initial inventory was published in May 2003 and is undergoing review and updates. The DoD inventory contains approximately 2300 munitions response sites.

According to a 2001 GAO report, DoD estimates that "over 16 million acres of land on closed, transferred, and transferring ranges are potentially contaminated with unexploded

[1] EPA 505-B-01-003, February 2002

ordnance," and that it has "about 1,500 contaminated sites."[2] In terms of cost, the DoD Fiscal Year 2000 Agency-wide Financial Statement reflects a $13.1 billion level of effort programmed until an inventory of all ranges is completed and regulatory requirements are finalized. However, the GAO study concluded that because DoD does not have a complete inventory and has not used a consistent cost methodology, this amount cannot be relied upon and is likely significantly understated. GAO further stated that other DoD estimates show that its liability for cleanup of non-operational ranges could exceed $100 billion.

Historically, millions of acres of former munitions ranges were transferred from the military to non-Federal entities or other Federal agencies to be used for other purposes (most of these properties show up as formerly used defense sites or FUDS). As noted above, DoD is currently working to further define the inventory of the sites and acreage that are potentially contaminated. Furthermore, active military installations and installations affected by the Base Realignment and Closure (BRAC) program have closed ranges and other sites contaminated with OE. While some of the sites are fairly small (e.g., small arms ranges, burial pits and trenches), others may be dozens or even hundreds of square miles in area (e.g., bombing ranges). Ranges or other sites contaminated with OE may potentially have soil, ground water, and surface water contamination from munitions constituents (including explosives and heavy metals, and at a small number of sites, chemical warfare agents, or depleted uranium). The munitions constituents may derive from partially detonated and decomposing ordnance and explosives from training activities, flares, smoke grenades, open burning and open detonation (OB/OD) disposal activities, munitions burial sites, weapons testing, and other military activities (such as training or research and development). Of course, the potential for premature detonation of OE is generally the principal concern during initial response actions.

The actual and potential human health and environmental effects can vary from being fairly localized to being widespread. Many incidents of UXO finds/exposures by civilians have been documented in the press and elsewhere and some have resulted in explosions, injuries, and fatalities. A number of chemical exposures with associated health effects have also been reported, many related to chemical warfare agents. The costs associated with the assessment, cleanup, and ongoing risk management actions (e.g. maintaining fenced properties) of these sites are expected to be significant.

3. What is the scope of EPA's Guidelines?

[2] "DoD Training Range Cleanup Cost Estimates Are Likely Understated," GAO-01-479, April 2001, p. 17

For purposes of these Guidelines, the term "OE"[3] is meant to encompass (1) munitions, munitions components, and bulk explosives that have been fired, expelled from demolition pits or burning pads, discarded, abandoned, or buried; such munitions, munitions components, and explosives are no longer under accountable record control of any DoD organization or activity; (2) soil presenting reactivity or ignitability hazards due to the concentration of energetic materials present in the soil; and (3) buildings or structural materials contaminated with energetic material residues that present reactivity or ignitability hazards.

Response Actions

EPA recommends that these Guidelines be used during munitions response actions where OE is suspected to be or has been encountered. This includes response actions conducted under the investigation and cleanup authorities of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the corrective action authorities of the Resource Conservation and Recovery Act (RCRA), and, where appropriate, other federal environmental authorities such as the Safe Drinking Water Act (SDWA). The Guidelines may also apply to enforcement, permitting, and emergency or time critical actions where OE is involved.

Environmental problems with similar circumstances should elicit consistent and fair application of enforcement tools, according to the EPA Office of Enforcement and Compliance Assurance (OECA) Operating Principles, issued in 1996.[4] Those principles also state that development of response strategies should include "consideration of statutory authorities to decide whether a single or a multimedia approach might be most effective."

According to OECA policy, when necessary, EPA should take enforcement actions at Federal Facilities to abate an imminent and substantial endangerment. If EPA determines a site poses an imminent and substantial endangerment, and the responsible parties fail to reach an enforceable site-specific agreement regarding response action with EPA, or otherwise fail to respond in a timely fashion, an enforcement order based on the nature of the contamination and site-specific situation may be appropriate.

Regions should consult the EPA intranet for information and for EPA regulations, policy, and guidance on relief available against Federal Agencies under environmental statutory imminent hazard authorities, including the text of sample orders and other Federal Facilities

---

[3] Although these Guidelines do not specifically address chemical or biological warfare (CBW) material, the principles are generally applicable to these materials. Specific information on CBW may be added in future revisions.

[4] Operating Principles for an Integrated Enforcement and Compliance Assurance Program, issued by OECA in 1996.

Enforcement Office policy and guidance with respect to imminent hazards. (See section 11 for more guidance related to enforcement.)

Historically ranges were referred to as "active", "inactive", "closing", "closed', or "transferred". DoD recently changed the categorization of ranges to either "operational" or "non-operational." The term "operational" includes both active ranges and inactive ranges remaining under DoD control; the term "non-operational" includes closed, transferred, and transferring ranges. These Guidelines are directed primarily toward responses at what the DoD calls "munitions response areas," which includes areas on non-operational ranges and other sites at which munitions response may be appropriate. Except as explained below, the Guidelines do not apply to operational ranges, which generally involve a number of additional considerations, such as the continued introduction of OE on such ranges.

Applicability to Munitions Response Areas

These Guidelines focus on non-operational ranges and sites other than ranges at which OE may be encountered. Non-operational ranges are those former military ranges that have been closed by DoD or whose current or potential use or setting makes their use as ranges no longer acceptable or compatible (as determined by DoD). These include former ranges located on formerly used defense sites (FUDS), BRAC properties, as well as closed ranges on active installations. In addition, the Guidelines apply to other sites where OE may be encountered (e.g., scrap yards, disposal pits, ammunition plants, DoD ammunition depots, OB/OD units, and research and testing facilities).

Applicability to Operational Ranges

EPA recognizes the vital role that operational ranges hold in military training and readiness. Maintaining military readiness for protection of national security requires ongoing weapons testing and troop training activities. DoD generally addresses environmental issues at operational ranges through its environmental compliance program. The RCRA Military Munitions Rule specifically excludes from hazardous waste regulation the "recovery, collection, and on-range destruction of unexploded ordnance and munitions fragments during range clearance activities at active and inactive ranges" to facilitate DoD range management (environment, safety, readiness) activities.[5]

There has been only one case where enforcement of EPA regulations has caused a change in training activities at an operational range. The Massachusetts Military Reservation (MMR) in

[5]40 CFR 266.202(a)(1)(iii). Regions should note, however, that the Rule does not exclude "on-range disposal or burial of unexploded ordnance and contaminants when the burial is not the result of product use." Such activities may require a RCRA permit.

Cape Cod, Massachusetts is the only military facility at which EPA has taken an action that required the military to stop live-fire training. EPA took this action to stop the spread of contamination to the only drinking water source for hundreds of thousands of people. The Army has continued to conduct training using small arms at MMR, as well as other training without using explosives, propellants, and pyrotechnics. The EPA order allows the Army to petition to resume live fire training, but it has not submitted such a petition to date.

Typically, EPA will defer to the military regarding management of explosives, munitions, munitions fragments, and munitions constituents on an operational range. However, EPA still retains independent authority and EPA Regions should evaluate situations where a threat to human health or the environment is posed or suspected by releases or the threat of release from operational ranges. Typically this will be where munitions or their constituents migrate or may be poised to migrate off-range via surface water, ground water, or air. There could also be instances where contamination on an operational range poses a risk to human health or the environment such that response may be needed.[6] For response actions related to operational ranges, Regional Offices should first confer with the military component relative to assessing and managing the risk from such operational ranges. Generally, based upon this consultation, it is expected that the Region will obtain sufficient information and assurances to defer action to the military component. This is especially true for response operations on the range and the establishment of explosive safety distances ("exclusion zones") when intrusive activities are underway.

Regional Offices are expected to use prudent discretion when considering taking or requiring the military to take any response actions involving operational ranges. EPA assumes that under normal circumstances situations involving the risk of explosion of munitions or munitions constituents on operational ranges will be addressed by the military component with jurisdiction, custody, and control of that operational range. When a Region believes that EPA should take an enforcement action against a military component on an operational range, the Region must consult with the Directors of the OECA Federal Facilities Enforcement Office (FFEO) and OSWER FFRRO prior to conferring with the military component.

If the Region believes that EPA should issue an order to a military component under the imminent hazard provisions of any environmental law requiring that military component to abate an imminent and substantial endangerment on an operational range, such an order would constitute an enforcement matter of national significance and under the appropriate delegation of authority require the concurrence of the Assistant Administrator for the Office of Enforcement and Compliance Assurance. (See May 19, 1995 Memorandum entitled "Office of Enforcement

---

[6] For example, at Fort Richardson, AK, the Army remediated under CERCLA a portion of a range by removing white phosphorus to protect ducks and other wildlife. At Tobyhanna Army Depot, a CERCLA response action put in place a fence to restrict public access to an active range, which is now classified as closed.

and Compliance Assurance and Regional Roles in Civil Judicial and Administrative Site Remediation Enforcement Cases"[7]; July 11, 1994 memorandum on "Redelegation of Authority and Guidance' on Headquarters Involvement in Regulatory Enforcement Cases"[8], and "Guidance on Coordination of Federal Facility Enforcement Actions with the Office of Enforcement" dated October 20, 1992[9]. Regions should treat as enforcement confidential any incipient imminent hazard determination with respect to an operational range that would give rise to an EPA enforcement action and immediately consult with FFEO prior to release of any information concerning such determination outside the Agency.

In addition, where Regions become aware that the accessibility to a range is allowing the public to come into direct contact with OE, the appropriate installation commander should be notified immediately and asked to take the necessary steps to prevent such access. Regions are then asked to notify FFRRO and FFEO of the situation.

4. What are the general regulatory authorities that can be used?

Multiple regulatory authorities may govern response actions at munitions response sites. DoD and the Federal Land Managers (e.g., Bureau of Land Management, Forest Service) generally prefer to use CERCLA as their authority for conducting responses at non-operational ranges and other OE sites. The March 2000 DoD/EPA *Principles* cited earlier acknowledge this by describing the use of "a process consistent with CERCLA" and the *Principles* as the "preferred response mechanism" for OE . As further explained in the *Principles*, following such a process will generally also "meet any applicable RCRA corrective action requirements." However, such a preference does not preclude EPA or another regulatory entity from using other applicable authorities.

EPA recognizes that there are circumstances in which RCRA or another authority will be the appropriate and preferable vehicle under which an OE response should be conducted. For example, responses under RCRA may be appropriate where the site already has an active RCRA activity (e.g. a closing OB/OD unit at a BRAC site or where there is an imminent and substantial endangerment situation). At MMR, for example, a RCRA order was needed to dispose of munitions that had been gathered for disposal. At the Former Lowry Bombing and Gunnery Range in Colorado, the State, under its own authorities, reached an agreement with the Army Corps of Engineers to conduct the response. Authorities other than CERCLA that may be appropriate for a given OE response include, but are not limited to, the following:

---

[7] http://www.epa.gov/swerffrr/documents/051995.htm

[8] http://www.epa.gov/Compliance/resources/policies/cleanup/superfund/case-redel-rpt.pdf

[9] http://www.epa.gov/swerffrr/documents/epa692.htm

- Safe Drinking Water Act (SDWA, 1974, 42 U.S.C. §300f et seq.; 40 CFR Parts 141-149);
- Resource Conservation and Recovery Act (RCRA, 1976, 42 U.S.C. §6901 et seq.; 40 CFR Parts 240-282);
- Clean Water Act (CWA, 1972, 33 U.S.C. §1251; 40 CFR, Parts 100-136, 140, 230-233, 401-471, 501-503);
- Clean Air Act (CAA, 1970, 42 U.S.C. §§ 7401, 7412(r) and 7603;
- State Superfund Laws;
- State RCRA Programs;
- Other State or Tribal hazardous waste management programs.

5. What about response actions using CERCLA authorities?

Consistency with CERCLA

EPA believes that OE *typically* meets the definition of a hazardous substance under CERCLA because it is likely to contain or be comprised of listed hazardous substances (see 40 CFR 302) or because OE (or a component thereof) meets the definition of RCRA regulated hazardous waste. For example, OE (or a component thereof) on non-operational ranges is generally a RCRA statutory solid waste. Once OE (or a component thereof) is actively managed (e.g., collected) at non-operational ranges, it is RCRA regulated hazardous waste if it meets the characteristics of ignitability, reactivity, or TC toxicity under the criteria of 40 CFR 261.21, 261.23, or 261.24. However, certain substances or materials associated with OE (e.g., scrap metal) may or may not be considered a hazardous substance, making case-by-case review imperative.

Releases or threats of releases associated with OE should be evaluated in the same manner as would be any other release to see if the material present meets the CERCLA definition of a hazardous substance. Although some material associated with OE is not a hazardous substance (e.g., inert scrap), the need for responses to OE should be evaluated on a site-specific basis to ensure that human health and the environment are protected. Where CERCLA is used as the authority to take a response action, any OE responses should comply with CERCLA, the National Contingency Plan (NCP), and should consider other appropriate Agency guidance (e.g., Data Quality Objectives (DQOs)) and the guidance provided in the DoD/EPA *Principles*. As specified in the *Principles*, where the DoD is conducting response actions under its Defense Environmental Restoration Program (DERP), those response actions must be consistent with CERCLA and the NCP, and consider EPA policy and guidelines (see CERCLA Section 120, 10 U.S.C. 2701 et seq. (DERP), and Executive Order 12580). Use of CERCLA does not, in and of itself, preclude States from using their authorities. (See CERCLA 120(a)(4).)

CERCLA section 120(a)(2) prohibits Federal Facilities from adopting or utilizing any guidelines, rules, regulations, and criteria applicable to CERCLA remedial actions that are inconsistent with EPA CERCLA remedial action requirements. Consistency with the NCP and use of EPA policy and guidelines apply to every phase of response. (e.g., removal, PA/SI, RI, FS, RD, RA, O&M)

Use of Removal or Remedial Authorities Under CERCLA

Response actions should consider the full range of CERCLA authorities. Although public safety and worker safety (generally the primary risk posed by OE) is usually the most immediate consideration in determining what actions to take, not all situations in which OE is or may be encountered require immediate response actions. Such non-time critical removal actions may lend themselves to strict compliance with applicable or relevant and appropriate requirements (ARARs) to the maximum extent possible, and evaluation of alternatives in advance of the need for response. On the other hand, certain types of removal actions (emergency response and time-critical removals) necessarily allow for reduced levels of public and regulatory involvement. In all cases, EPA should give great weight and deference to military or qualified, trained contractor explosives or munitions emergency response specialists with regard to explosives safety considerations.

Consistent with the NCP, EPA expects the Lead Agency to consider, among other things, the following when evaluating what kind of response action should be taken:

- **Emergency removals** should be used when an immediate or imminent and substantial danger to public health or the environment is present and action is needed within hours. These will generally be situations in which the military will have difficulty controlling potential exposures to OE.
- **Time-critical removals** are actions that must be taken within days or weeks and that allow a **planning period** of less than six months.
- **Non-time-critical removals** are those that allow a planning period of six months or more.
- **Remedial actions** will generally be needed at sites with extensive soil and ground water contamination or extensive subsurface clearance requiring complex cleanup decisions.

Many sites will involve a combination of actions to achieve permanent remedies. For example, the response at an OE site might include:

- Time-critical removals to conduct surface clearance, erect access barriers such as fences, or to otherwise prevent exposure to OE that is in close proximity to nearby populations posing an immediate threat;

- Non-time-critical removals involving surface and shallow subsurface clearance to facilitate additional OE or hazardous waste investigations; and,
- Remedial actions designed to achieve permanent remedies (including investigation and response) by addressing issues related to land use, degree of subsurface clearance, type of remedy, use of institutional controls, or soil, surface water, and ground water remediation.

These examples are not meant to be all inclusive, nor are they meant to imply when a removal or remedial action should be taken. These are instead meant to illustrate responses that, when examined site specifically, may be appropriate.

Emergency Response Under RCRA or CERCLA

An "emergency response" generally refers to a situation in which there is an imminent and substantial threat to human health or the environment and actions should be taken within hours. The RCRA Munitions Rule provides that "explosives or munitions emergency response specialists" (see Appendix for definition) base any determination of the need for an emergency action upon an "actual or potential immediate threat to human health, including safety, or the environment, including property."[10] The Munitions Rule assigns to the explosives or munitions emergency response specialists the responsibility for making this determination, which will ordinarily be a judgment call by the specialist.

The urgency of a situation may or may not allow for consultation with EPA, State or Tribe, depending on the situation. Similarly, the urgency of addressing a specific emergency with imminent risks may make timely coordination with Federal Land Managers and/or the public difficult or impracticable. The requirements for the Lead Agency to consult with regulators prior to taking a response action involving OE, do not apply if DoD is the Lead Agency acting under the DERP[11]. The opportunity for review and comment does not apply if a response is an "emergency removal taken because of imminent and substantial endangerment to human health and the environment and consultation would be impractical".

Similarly, the RCRA Munitions Rule exempts explosives or munitions emergency or time critical responses from hazardous waste regulatory requirements, including notifications, except that a record of the response must be kept.[12] Some States, however, may have added additional requirements in adopting the Munitions Rule (e.g. a notification requirement).

---

[10] 40 CFR 260.10

[11] 10 U.S.C. 2705(b)(2)

[12] 40 CFR 270.1(c)(3)(iii)

The RCRA Munitions Rule specifies that the explosives emergency response specialist is the one who determines if it is an emergency response situation. The preamble to the Military Munitions Rule states that if, in the opinion of the explosives emergency response specialist, there is time for consultation with a regulatory authority it may not be a true emergency and DoD should so consult.

Many UXO items may be corroded or otherwise degraded, making it difficult to ascertain whether they are live or inert. Consequently, response personnel will ordinarily assume such items are live, and that they therefore present a potentially acute explosive hazard unless they can determine otherwise. Deference should be given to this judgment, but the explosive emergency response specialist should be able to describe and document afterwards the basis for this determination. This response is appropriate for discrete emergency situations, however, and should not be the default response applied to large expanses of uncharacterized range areas.

Removal Actions

The following should be noted when removal actions are being considered:

- Explosives safety, including that of the response personnel, is recommended as the first factor considered in determining the best approach to the removal action.
- Removal alternatives under CERCLA will be evaluated under the criteria set forth in the NCP (NCP Section 300.415).
- Removal actions shall, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action (NCP Section 300.415(c)).
- In accordance with the NCP, the Lead Agency should to seek EPA Regional, State, and local participation in the process (i.e., coordination), including comment on the cleanup alternatives, with the exception of when an emergency precludes it (see DERP, for specific DoD requirements and NCP Section 300.415(m)). In addition, the Lead Agency is expected to coordinate and communicate with property owners and/or tenants, including civilian, Federal, State, Tribal, and local government agencies.
- At the conclusion of a removal action, we suggest that an evaluation be made regarding the need for further investigation and/or response. Since the decision could be "no further action," another removal(s), or a remedial action(s), regulatory consultation is critical. At NPL sites, the decision must be made with the concurrence of EPA.
- If DoD, in coordination with environmental regulators, determines, based on explosives safety, human health, and environmental concerns, and the *Principles,* that the removal action will not fully address the threat posed and remedial action may be required, EPA should expect an orderly transition from removal to remedial response activities.

In summary, response at an OE site will very often appropriately include one or more removals, whether with subsequent remedial work or as the only vehicle. The decision to conduct a removal rather than using remedial authority, however, should be made only after careful consideration of the circumstances at each site.

Remedial Cleanup Process

When the remedial cleanup process is used, remedial alternatives (which may include land use controls) need to be evaluated against the nine evaluation criteria identified in the NCP. The most relevant of these criteria for remedial actions at sites where there are explosives safety considerations are short-term effectiveness, implementability, and overall protection of human health and the environment. Explosives safety considerations may also involve evaluation of the "technical impracticability" waiver of ARARs.

Complete OE clearance to a level allowing unrestricted use will not always be possible, making the use of land use controls (LUCs) necessary in many, if not most situations. However, we recommend LUCs not be the principal or sole remedy component to ensure protectiveness (see section on Land Use Controls, below). As explained in the NCP, "The use of institutional controls shall not substitute for active response measures . . . as the sole remedy unless such active measures are determined not to be practicable based on the balancing of alternatives . . . "[13]

6. How are State and Tribal Environmental Regulators and the Public Involved?

Participation of State and Tribal Environmental Regulators

In OE response actions, States may elect to participate utilizing a number of different mechanisms. State environmental regulatory agency involvement should be encouraged since it is generally key to ensuring the protection of human health and the environment. A State will be the lead regulator at many OE sites.

All parties have an interest in effecting safe and environmentally sound cleanup of these ranges and explosive and ordnance waste sites. Generally, States, by virtue of State environmental statutes and regulations, including state hazardous waste laws authorized under Resource Conservation and Recovery Act (RCRA), have the primary decision-making role within the parameters of those existing statutes.

Although there are difficult technical challenges to be met in addressing OE sites, States consider , along with EPA, regulatory oversight to be essential to ensuring adequate responses

[13] 40 CFR 300.430(a)(iii)(D).

and are especially positioned to make decisions concerning adequacy of site characterization, appropriate response to contamination, establishment of cleanup standards and appropriateness of relying on institutional controls.

Response Under RCRA and/or Other State Authorities

Existing State authorities can be used to effectively resolve many of the OE issues that affect millions of acres of land. As with CERCLA, RCRA regulations or State equivalent authorities cover a majority of the process needed to manage OE from discovery to destruction.

Participation of States and Tribes in the evaluation and cleanup of OE sites is an important aspect in overall protection of human health and the environment. In many cases, a State or Indian Tribe will be the lead regulator at an OE site. In recognition of their status as co-regulators and/or sovereigns, State environmental regulatory agencies and Indian Tribes should be:

- Provided with meaningful opportunities to participate in the response process along with the Lead Agency(e.g., identification of ARARs, site characterization, provide oversight of responses, concur that a site response is complete) and,
- Provided with meaningful opportunities to participate in the development of, and to comment on, project documents prepared to support the response action.

Notification in the Case of Emergency Response

EPA recommends that the Lead Agency give at least oral notification to the State or Tribal governments and to the cognizant Federal Land Management Agency within 24 hours of initiating an emergency response, with written notification occurring within 7 days.

Public Participation

In accordance with CERCLA and the NCP, and consistent with existing Agency, OSWER, Superfund, RCRA, and Federal facility policies, as well as DoD and DoD Component policies, public participation is essential to developing a sound, credible, and publicly acceptable response. Communication with all parties will help facilitate understanding and answer the community concerns that the discovery of OE, or dissemination of reports about the discovery of OE, often generate. Enhanced outreach may be appropriate to address public concerns, and efforts in this regard by the responsible Lead Agency should be encouraged. Also, at FUDS, which have been in the public/private domain for many years, public participation often results in the revelation of site-specific information pertinent or critical to the investigation, potentially resulting in efficiencies and cost savings.

We recommend that Lead Agencies responsible for conducting and overseeing range response activities take steps to identify and address the issues and concerns of all stakeholders. Public involvement programs related to the management of response actions on OE sites should be developed and implemented in accordance with applicable EPA and DoD policies. Such communication efforts would have the overall goal of ensuring that decisions made regarding response actions on OE sites reflect a broad spectrum of stakeholder input.

7. What about explosives safety considerations?

Safety Considerations Related to Response Actions

EPA expects great weight and deference to be given to the decisions of military or qualified, trained contractor explosives or munitions emergency response specialists at the field level unless there is clear and compelling reason to question the expert's technical judgment in a given instance. If EPA Regional field personnel believe there is a clear and compelling reason to question the technical judgment in a given instance, EPA staff and the Lead Agency counterparts immediately should consult with Regional management and the appropriate corresponding levels within the Lead Agency organization.

The NCP assigns to DoD the lead responsibility for responses involving military munitions.[14] EPA staff overseeing munitions response actions, however, have an independent responsibility to evaluate the environmental and public safety aspects of the planned response action. As a matter of policy (and a matter of regulation under RCRA in emergency situations), EPA should defer to military or qualified, trained contractor explosives or munitions emergency response specialists on the safest approach to clear munitions. While EPA may generally support decisions made by explosives or munitions emergency response specialists on explosives safety issues, site specific decisions affecting a small area made by these specialists should not automatically be extrapolated to large expanses of that range or to other OE sites without sufficient justification.

Once found, several options exist for addressing OE. Explosive safety concerns may make advisable destroying OE where it is found (called "blow in place"). Where there are environmental and/or safety concerns to blow in place and it is safe to move, OE may be consolidated at a safe, central area or at a controlled detonation chamber on or off-site and destroyed. The use of on-site "render safe" procedures to disable the munitions is rare, but may be an option for OE where it is unsafe to either blow in place or pick up and carry away. "Render-safe" is not a treatment/disposal procedure, however, but is instead only a means to allow the munitions to be moved to another location for disposal. Finally, it may be possible in unusual circumstances to transport OE off-site for treatment/disposal. Such shipping will not

[14] 40 CFR 300.120(d)

ordinarily be a feasible option, and would require that an EOD technician first certify that each item was safe to ship.

The competing safety considerations concerning an OE response action are, on the one hand, whether the OE is safe to move on-site, is safe to transport off-site, can be rendered safe for transport, and, on the other hand, whether the current location is safe or can be made safe using mitigation measures, to treat or "blow in place." These considerations affect the subsequent decision on whether to (1) blow in place, (2) move for consolidated detonation on-site, or (3) transport off-site for treatment/disposal. Considerations in making these decisions include:

- An evaluation of human health and environmental effects, which includes explosives safety considerations to the workers;
- The proximity of the OE to people, buildings, cultural resources, etc., and whether this makes blowing the ordnance in place an unacceptable hazard; and
- Render-safe procedures. However, these are rarely considered acceptable by explosives safety experts given the exceptional additional risk to human life, the condition of the ordnance, its potential instability, and the difficulty in discerning the condition of the fuses and whether the fuze is armed.

Site-Specific Health and Safety Plans (SSHPs)

The NCP requires that a Site-Specific Health and Safety Plan be prepared for every non-emergency CERCLA action (investigation and response),[15] and such plans should be standard for OE responses, even if not performed under CERCLA. There is a large body of DoD, USACE, and other DoD component guidance concerning OE safety that should be reflected in SSHPs. DoD Explosive Safety Board (DDESB) policy states that the plans must be reviewed and approved by appropriate explosives safety experts prior to initiation of all site work, except in emergency situations. In addition, given the public health and safety implications of OE investigations and clearance, EPA recommends that SSHPs be reviewed by regulators (EPA and/or the relevant State or Tribe) prior to initiation of work. For more detail on explosives safety requirements, see Chapter 6 of the OE Handbook.

8. What are the site characterization expectations?

Historical Documentation of Site Activities

Relevant historical information concerning a site is fundamental to planning an appropriate and thorough site characterization. DoD compiles this information in an Archive

[15] 40 CFR 300.430(b)(6)

Search Report (ASR), which includes, or is based upon, interviews with personnel who were/are employed or were/are stationed at the site, or who otherwise would have direct knowledge of relevant activities there. EPA strongly advises, in addition to such interviews, review of historical aerial photography; historical facility maps; construction drawings; shipping records; records of any previous clearance activity; records of any disposal or open burning/open detonation (OB/OD) activities; and other available information. Ideally, before starting a historical records search/ASR, the Lead Agency should have coordinated with the lead regulatory agency in scoping the work.

The historical records search/ASR can be used to identify potential OE locations, types and quantities of OE, and OE management methods. This information is then used to:

- Identify the types of ordnance used at the facility and areas or locations at which they were used, treated (OB/OD), or buried;
- Identify areas of the facility where ordnance may not have been used, thereby reducing that size of the area to be investigated;
- Prioritize the investigation in terms of likelihood of ordnance presence, type of ordnance used, public access to the area, and planned end uses; and
- Consider the need to address explosives safety issues prior to initiating the investigation.

While historical records searches/ASRs are important to characterizing sites, Regions are cautioned that their reliability may be limited by such factors as poor records, incomplete information, or faulty memories. Therefore, we suggest that ASRs be scrutinized closely to identify potential gaps and ascertain their accuracy and thoroughness.

Systematic Planning Process

As with any other environmental investigation, effective site characterization uses a Systematic Planning Process (SPP) to develop the goals of the investigation (i.e., the specific decisions to be made), identify the specific objectives of the investigation, and design an appropriate sampling and analysis effort. (USACE uses an analogous process called Technical Project Planning or TPP (see USACE Engineering Manual EM 200-1-2 for more information on the TPP process.) Involvement of EPA or other (State, Tribal, Federal Land Manager) staff in the SPP process, from scoping through development of the sampling and analysis plan (SAP) and quality assurance project plan (QAPP) is imperative for acceptance of the site characterization results. This involvement will help ensure that the information from the sampling and analysis efforts provides data that are usable for the decisions to be made and that the involved authorities share a common understanding with the explosives emergency response specialist(s) or other response personnel as to safety considerations.

Use of Conceptual Site Models

An important aspect of the Systematic Planning Process at OE sites is the development and continuous refinement of a sound conceptual site model (CSM). The CSM establishes a working hypothesis of the nature and extent of OE contamination and the likely pathways of exposure to current and future human and ecological receptors, and will guide the investigation at the site.

The initial CSM should be created once project decision goals are defined and historical information on range or site use and the results of previous environmental investigations are gathered. The CSM then continues to evolve as new data about the site are collected, since information gathered at each stage of the site characterization and remediation process is used to review earlier hypotheses and guide any appropriate revisions.

Chapter 7 of the EPA OE Handbook offers more detail on the CSM process, but in summary, the CSM describes the site and its environmental setting, and presents hypotheses about the types and locations of contaminants, their routes of migration, and potential receptors and exposures routes. This might include such things as:

- Topography and vegetative cover;
- Past ordnance-related activities (e.g., ordnance handling, weapons testing and training, ordnance disposal) and the potential releases that may be associated with these activities (e.g., buried munitions, dud-fired UXO, kick-outs from OB/OD areas);
- Expected locations and the depth and extent of contamination (based on the OE activities);
- Likely key contaminants of concern;
- Potential exposure pathways to human and ecological receptors (including threatened and endangered species);
- Environmental factors such as frost line, erosion activity, and the groundwater and surface water flows that influence or have the potential to change pathways to receptors;
- Human factors that influence pathways to receptors;
- Location of cultural or archeological resources; and,
- Reasonably anticipated future land use.

EPA Review of Sampling and Analysis Plans (SAP) Under CERCLA

When removal or remedial investigations are conducted under CERCLA consistent with the NCP, SAPs generally must be prepared to ensure that the data obtained are of the quantity and quality necessary to support the decisions to be made. These SAPs will generally consist of two parts: (1) a field sampling plan that describes the number, type, and location of samples and the types of analyses, and (2) the Quality Assurance Project Plan (QAPP), which describes current organization, functional activities, and data quality objectives (DQOs) and actions necessary to ensure that data are adequate for use in selecting a remedy. NCP section

300.415(b)(4)(ii) requires EPA approval of SAPs for CERCLA non-time critical removal actions but not for emergency or time critical removal actions. SAPs for remedial investigation/feasibility study activities must be reviewed and approved by EPA in accordance with NCP Section 300.430(b)(8); QA/QC requirements for remedial design and remedial action activities generally will be consistent with NCP Section 300.435(b).

On a site-specific basis, where EPA is performing oversight, the party conducting the response action and EPA need to reach agreement on standards and procedures for characterization at OE sites. Most critical is agreement on DQOs for site characterization efforts at OE sites. DQOs, once established, will guide site characterization planning, sampling method selection, analytical technique selection, and the level of uncertainty that is acceptable for decision-making purposes.

Investigations should not be limited to within the "fence line," especially when information suggests that OE contamination/exposure problems are more extensive.[16]

Maintenance of a Permanent Geophysical Record of the Investigation

We recommend that the Lead Agency develop and maintain a permanent record of the geophysical data gathered to characterize a site including methods that log the data into a computer and electronically locate (via satellite or other accurate means) each object or potential OE item (i.e., geophysical anomaly). These are referred to as "digitally recorded and geo-referenced" data. Exceptions to the collection of geophysical data might be limited to emergency response actions or cases where such electronic record is impracticable. However, it is often prudent, to follow emergency responses with geophysical confirmation of the full removal of the OE items. We suggest that the permanent record be included in the administrative record and be provided upon request, in its entirety, to Federal and State regulators, Federal Land Managers, and Tribes.

Integration of Site Safety, OE, and Environmental Investigations

The most effective approach to site characterization integrates safety considerations, OE geophysical investigations, and chemical investigations for other environmental contamination. Such integration has been demonstrated in the field to be safer and more cost-effective since it typically eliminates duplication of efforts (e.g., separate explosives safety efforts for either OE or other environmental contamination). For example, following the initial review of existing information and a visual reconnaissance of the range, a surface clearance of OE may be necessary to address the immediate explosives safety concerns. A next step might then be the use of a geophysical method, which may be necessary to map the site for potential OE under the surface.

[16]CERCLA addresses the extent and location of contamination in "releases," rather than at sites bounded by their "fence lines."

The subsurface clearance activities, when properly planned, executed, and recorded, can provide valuable information regarding the subsurface distribution of OE and can help guide the geophysical investigations. If soil or ground water sampling is needed to determine the nature and extent of soil and/or ground water contamination, the results of the surface and subsurface clearance can guide where to take samples. Also, additional geophysical and other special procedures to protect against any explosive hazard might be put in place to allow for the safe extraction of core samples. In some instances it may be necessary to modify a site investigation strategy due to explosives safety concerns.

Statistical Sampling

Statistical based sampling has been used in the development of sampling and analysis plans, as well as for site closeout sampling for chemical releases for many years. EPA has published numerous guidance documents to assist in the identification and selection of the proper statistical methods based on site conditions and the type of decisions that need to be made at a site. For ordnance sites, the Army Corps of Engineers has developed several tools to assist in site characterization and prioritization activities. These include SiteStats/GridStats, OECert, and UXO Calculator. EPA has found these tools to be generally inadequate for **final** cleanup decisions, however, they have some utility for preliminary site characterization and screening.

These tools are limited in use for a number of reasons. First, they assume a homogeneous distribution of ordnance in the area under investigation. Real world experience has shown this type of distribution is not commonly found at ordnance sites. In fact, information on type and location of range activities, targets, firing positions, and test areas enables the development of an investigation and sampling plan that starts with real world assumptions about the non-homogeneous nature of the OE distribution based on knowledge about distribution and scatter patterns at similar rang types already investigated. Such information, where available, enables investigation and sampling schemes to radiate from the areas of concentrated OE to better determine the extent of OE distribution. Second, the reliance on sampling of a very small percentage of an ordnance site (often less than 3 %) and extrapolating the results to make remedial action decisions introduces the likelihood for substantial uncertainty in the decision making process. This in turn can lead to revisiting decisions and additional clearance at sites that were considered cleared of ordnance.[17] Third, the development of faster, better, cheaper, more comprehensive, and more reliable digital geophysical techniques (vehicle towed and airborne arrays, larger paths for handhelds, digital processing enabling faster and more accurate data acquisition) render such limited statistical approaches obsolete in most situations. Fourth, the total costs of cleanups based on more comprehensive digital geophysical investigations and the importance of reducing uncertainties for OE investigations make it more cost effective to focus

[17]For more discussion on EPA concerns on these models, see FFRRO's January 19, 2001 memorandum, *Interim Guidance on the Use of SiteStats/GridStats and Other Army Corps of Engineers Statistical Techniques Used to Characterize Military Ranges*.

on more comprehensive geophysical surveys up front rather than an iterative explorative statistical approach. Statistical approaches may be appropriate in those situations when data acquisition is particularly difficult or expensive due to terrain or vegetation.

Over the past few years, efforts have been initiated by the EPA National Exposure Research Lab and DoD's Strategic Environmental Research and Development Program (SERDP) to evaluate the strengths and limitation of statistical methods for different ordnance distributions in the environment. These efforts, particularly by SERDP, are moving toward the development of site planning and investigation tools that will allow project teams to evaluate different ordnance distribution patterns. The Visual Sampling Plan is one such tool that is developing inputs to allow a site project team to evaluate the affects of different distribution patterns, sampling methods, confidence intervals, and costs.[18]

In general, EPA believes that statistics based sampling at ordnance sites is best used as a screening tool to provide preliminary information concerning site conditions. This can be particularly useful when developing transect based sampling to locate firing ranges, impact areas, and some disposal areas where approximate location and size are known. Transect spacing can be very effective in the initial "search mode" when developed and deployed based on dispersal patterns of known weapons systems used at a site. Other appropriate uses of statistics at ordnance sites include development and evaluation of detection systems at geophysical proveout (GPO) sites. For a GPO, probability of detection and confidence intervals are typically DoD contract requirements, as well as data quality objectives for site project team decisions.

The use of statistics is more likely to be useful as a screening tool at larger sites where extensive geophysical analysis is not practical. The use of statistical sampling for smaller sites in the place of more comprehensive geophysical analysis and intrusive investigations may not be either warranted or cost-effective. Similar considerations may be warranted for sites in areas where terrain and vegetation make site investigations difficult to perform. When evaluating the use of statistical sampling methods, the following factors should be taken into account:

- The decision to be made by the project team.
- Agreement on the criteria on which decisions will be made.
- Agreement that statistics based sampling will provide a clear benefit to the decision making processes.
- Agreement on the assumptions and decision rules that are used in the statistical method.
- The assumptions on which the statistical sampling techniques are based on should be both clearly documented and appropriate to the particular site under investigation.

[18] Current version available at http://dqo.pnl.gov/vsp

- The level of confidence in the detection technology (i.e., is electromagnetic induction (EM), magnetometers, signal processing program, or some other method best suited for site conditions; do the site GPO results provide probability of detection/confidence intervals that will support decision-making).
- The use and amount of anomaly re-acquisition to verify findings of detection technology.
- The presentation of these data, summarized in an appropriate format.
- The quality and quantity of information from historical investigations.

Use of Alternative Detection Techniques

Historically, range characterization has relied on a set of techniques referred to as "mag and flag" to detect and define OE. "Mag and flag" involves an operator responding to audible and/or visual signals representing anomalies as detected by a hand-held magnetometer (or similar device), and placing flags into the ground corresponding to the locations where signals were produced. These techniques have significant weaknesses that can lead to significantly lower probabilities of detecting ordnance and high levels of either false positives or false negatives. "False positives" are anomalous items incorrectly identified as ordnance. "False negatives" are ordnance items incorrectly identified as non-ordnance, resulting in potential risks remaining in the ground.

Recently, major improvements have been achieved in the deployment of technologies used to detect OE and the processing of data post deployment to more effectively identify OE. The most appropriate and effective detection technologies at a given site will depend on the technology's capabilities in relation to site-specific factors such a munitions types, shapes, materials, mass, size, depth, extent of clutter, and environmental factors (e.g., soil, geology, terrain, vegetation, moisture, and temperature). The primary selection criterion is the technology's ability to maximize the probability to detect an ordnance item, but also important is the technology's ability to minimize the probability of false alarms and to discriminate ordnance from non-ordnance items. Often, these determinations are made by applying the performance results from controlled tests and experiences at other similar sites, supplemented by site-specific prove-outs.

Site-specific performances are verified by quality control checks during excavations, and sometimes by measuring the ability to detect munitions seeded in the remedial area prior to the geophysical investigation. In most situations nationwide, the use of these newer approaches and procedures will significantly increase the amount of OE detected, better distinguish between OE and non-OE items, reduce the number of false positives, and significantly reduce the total investigative and remedial time and costs (primarily by fewer false positive digs). "Mag and flag" should generally be limited to such uses as a preliminary tool during initial site field reconnaissance, for surface clearances, or use in those rare cases of difficult terrain that other

devices cannot traverse; we recommend it not be relied upon for no further action determinations.

As stated in the *DoD/EPA Principles*, digitally-recorded and geo-referenced sensor data should be collected and analyzed, and a permanent record of the sensor data and clearance results kept. The digitally recorded, geo-referenced permanent record allows for better analysis of the data. It also facilitates re-analysis of the data and permits a more accurate evaluation of the soundness of both the investigation and the remediation (important for regulatory oversight and increased confidence in land use decisions). Finally, it provides a data base for initiating later investigations should ordnance items be found in the future. Some of these techniques are described in the EPA OE Handbook.

9. What is EPA's policy towards transferring ranges?

Generally, EPA believes that the Federal Government retains ownership or control of those areas at which it has not yet assessed or responded to potential explosives hazards. Nonetheless, it is possible for property to be transferred prior to the initiation or completion of a response action at a closed range. Where Federal property known to or suspected of containing OE is proposed for transfer by lease or deed, it is recommended that evaluation of the risk associated with OE be part of the Environmental Baseline Survey, Environmental Condition of Property (ECOP)[19] document, Finding of Suitability for Lease (FOSL), Finding of Suitability for Transfer (FOST), Finding of Suitability for Early Transfer (FOSET), or comparable process for non-BRAC transfers. EPA will ordinarily support the leasing of property with adequate disclosure and appropriate access control mechanisms to ensure protection of human health and the environment. Adequate disclosure (to ensure protection of human health and the environment) would generally include a discussion of what is known about the property in terms of former land uses and potential OE, chemical warfare material (CWM), etc. contamination areas, what areas have been investigated and which have not, how investigated (e.g., geophysical surveys and digs, samples taken), what OE, CWM, and contaminants were found and where, and what remediation was done and where. Then, to be appropriate (to ensure protection of human health and the environment) access control mechanisms should generally directly relate to what is known about the site, addressing uncertainties and potential risks (e.g., because the site has not yet been adequately characterized and remediated), commensurate with the reasonably anticipated future land uses.

Prior to transfer by deed, the requirements of Section 120(h)(3) of CERCLA must be met requiring either that the CERCLA covenant (all necessary remedial action has been taken) be given, or that it be deferred by EPA and/or the Governor. Where OE is known or suspected to

[19] Required by Army Regulation 200-1, Section 15-6b for transfer of property between agencies.

remain on the property, it is suggested that land use restrictions be incorporated into an enforceable mechanism which will bind subsequent property owners and be monitored by the Federal agency with periodic reports to the regulatory agency(-ies). Where Federal property is being transferred with known or suspected OE, EPA believes all areas need to be evaluated in the CERCLA (including section 120(h)(3)) and the NCP context, or under the equivalent RCRA process.

10. What about land use controls?

Early Discussions of Land Use

Discussions with local land use planning authorities, local officials, and the public, as appropriate, should be conducted as early as possible in the remedy selection process to determine the reasonably anticipated future land use(s). These discussions would be used to scope efforts to characterize the site, conduct risk assessments, and select the appropriate responses. Generally speaking, for response actions on former ranges that are being or will be used for residential use, sufficient information should be provided to all stakeholders, including regulators, to enable them to conclude that the land is suitable for the intended use and that appropriate institutional controls can be applied to ensure continued protectiveness. The general goal is to identify and apply the best means to investigate the range and address the OE such that the actual use of the property is consistent with the reasonably anticipated future land use. In achieving this goal, EPA fully supports identification and application of the best demonstrated available technology (-ies) for OE detection and remediation. Although a response goal of 100 percent remediation may be sought, current OE technologies may not achieve this goal. The point, as with any contaminant investigation in areas of future unrestricted (residential) land use, is a) to generally use the best demonstrated available technology (as discussed previously), and b) to establish appropriate public communication and land use controls commensurate with what is known about the adequacy of the detection and remediation technology. See EPA Interim Final Policy *Describing Institutional Controls in CERCLA Records of Decision Documents (RODS) and other Remedy Decision Documents at Federal Facilities.*

Use and Evaluation of Land Use Controls (LUC) at OE sites

Land Use Controls (LUC) include any type of physical, legal (institutional), or administrative mechanism that restricts the use of, or limits the access to, real property to prevent exposure to hazardous conditions that may pose a risk to human health and the environment. The National Contingency Plan makes clear, however, that such controls "shall not substitute for active response measures as the sole remedy unless such active measures are determined not to be practicable."[20] The determination of the appropriate response actions, to include the

[20] 40 CFR 300.430(a)(1)(iii)(D)

establishment of LUCs, should be based on the planned reuse and specific requirements of each property. Where employed, LUCs should be adequately defined, roles and responsibilities for the LUCs should be made clear, and the LUCs must be enforceable.

Because of technical limitations, inordinately high costs, and other reasons, complete clearance of OE sites to the degree that allows certain uses, particularly unrestricted use, may not be possible. In such cases, LUCs will generally be necessary to ensure the protection of human health and safety and should be identified and implemented early in the response process to provide protectiveness. When supported by a site characterization that includes an adequate evaluation of reasonably anticipated future land uses, final LUCs should be considered during the process of developing and evaluating response alternatives, using the nine remedy selection criteria specified in the NCP[21]. This will ensure that any LUCs chosen as remedial actions are based on a detailed analysis of response alternatives and not presumptively selected. Roles and responsibilities for monitoring, reporting, and enforcing the restrictions should be clear to all affected parties. LUCs should be clearly defined, set forth in a decision document, and be enforceable to be effective.

When complete OE clearance is not possible at transferred ranges to allow for unrestricted use, we recommend that the Lead Agency notify the current landowners and appropriate local authorities of the potential presence of an explosives hazard and institute an appropriate public education program. The Lead Agency is expected to work with the appropriate State and local authorities to implement LUCs in situations where they are necessary to ensure protectiveness. State laws will be applicable to most LUCs, especially the requirements for deed restrictions and easements. The Lead Agency should monitor the selected remedy to ensure long-term effectiveness of the response, including any LUCs.

To expedite the property transfer process, the Lead Agency would work with EPA and/or State regulators and the community to evaluate LUCs while selecting the response action. The Lead Agency would then provide timely notice to prospective land owners/managers of the intent to use LUCs. Comments received during the development of draft documents should be considered and incorporated into the final LUCs, as appropriate. For BRAC properties, any unresolved regulatory comments should be included as attachments to the Finding of Suitability to Transfer (FOST). Where the military is performing the response action at FUDS, the assistance of Federal, State, and/or local regulators may be needed to impose land use controls on private or Federally-owned property.

11. What about the enforcement principles?

Oversight by Regulators

[21] 40 CFR 300.430(e)(9)(iii)

Regulatory oversight and involvement in all phases of OE site investigations is crucial to an effective response, as it increases the credibility of the response and promotes public acceptance. Such involvement includes timely coordination between the Lead Agency and EPA, State, or Tribal regulators, and, where appropriate, the negotiation and execution of enforceable site-specific agreements. Specific enforcement questions should be directed to FFEO or the Office of Site Remediation Enforcement (OSRE) in OECA.

EPA, States, or Tribal government regulators should conduct regulatory oversight at all OE sites where response actions are being conducted. The Lead Agency and appropriate environmental regulator, should try to reach a consensus as to the level of oversight necessary to achieve consistent protection of human health and the environment. The level of external oversight by regulators will depend on factors including, but not limited to, the known or potential nature and extent of environmental contamination or hazard at a site.

Negotiated Agreements: Federal Facility or Interagency Agreements

If the OE site is on the National Priorities List (NPL), the schedule for investigation and cleanup must be part of the required Federal Facility Agreement (FFA) or Interagency Agreement (IAG) (see CERCLA section 120(e)(4)(B)).

Negotiated agreements under CERCLA and other authorities play a critical role both in setting priorities for range investigations and responses and in providing a means to balance interdependent roles and responsibilities. Enforceable agreements provide a good vehicle for setting priorities and establishing a productive framework to achieve common goals. To achieve these goals, we believe that negotiated cleanup agreements should be developed in consideration of OE hazards, reasonably anticipated future land use, cost and funding, and other factors. Where range investigations and responses are occurring, the Lead Agency and the regulator(s) should attempt to reach a consensus on whether an enforceable agreement is appropriate. Examples of situations in which an enforceable agreement might be desirable include sites where there is a high level of public concern or where there is potential for significant exposure.

Treatment of Non-NPL, Privately Owned Formerly Used Defense Sites (FUDS)

As explained in EPA's FUDS policy[22], privately owned non-NPL FUDS will generally be treated in the same manner as other privately owned sites. When EPA is conducting the oversight at FUDS, EPA should focus on establishing EPA's oversight role (e.g., reviews, approvals, split and independent sampling, timely submission of sampling and analysis results) and negotiating orders to conduct work with the parties responsible for releases of hazardous substances, including DoD, consistent with existing enforcement and cleanup policies.

[22]"EPA Policy Towards Privately-Owned Formerly Used Defense Sites" (March 21, 2002)

To facilitate cleanup by responsible parties, and consistent with enforcement priorities, we recommend that Regions initiate PRP searches at FUDS early in the CERCLA process where parties other than DoD may be liable for releases or threats of releases of hazardous substances. In addition, EPA may issue unilateral orders to compel cleanup by any or all of the responsible parties under an appropriate enforcement authority, including, but not limited to, CERCLA, RCRA or the SDWA, where EPA determines that a site may present an imminent and substantial endangerment. Cleanup agreements/orders would include schedules for response action(s) that EPA determines to be needed, based on the site-specific situation and nature of the contamination.

In appropriate situations, EPA may implement CERCLA response actions at FUDS, as needed, to address releases and threats of releases of hazardous substances and proceed with cost recovery actions. It is EPA's expectation that States or Tribes will serve as the primary regulatory oversight agency at most non-NPL FUDS, although some circumstances (e.g., where the State is a PRP) may warrant substantial EPA involvement.

Dispute Resolution

To avoid or to resolve disputes concerning the investigations, selected remedies, or response actions at OE sites, the Lead Agency, EPA, and State or Tribal organization should attempt to reach consensus, each giving substantial deference to the expertise of the other party or parties. Within any dispute resolution process, the parties should give great weight and deference to explosives safety experts on explosives safety issues.

- At NPL sites, disputes that cannot be mutually resolved at the field or Project Manager level should be elevated for disposition through the tiered process negotiated between DoD and EPA as part of the interagency agreement for the site, based on the Model Federal Facility Agreement provisions. Where an agreement does not already exist, or where an existing Federal Facility Agreement (FFA) does not cover non-operational ranges within the NPL site, Regional Offices could attempt to negotiate with the DoD component a mutually acceptable Federal Facility Agreement pursuant to CERCLA Section 120, or could propose to amend any existing agreement to cover the non-operational ranges within the NPL site by the beginning of the next FFA amendment cycle, or next fiscal year, whichever is earlier. Where such negotiations are unsuccessful, the issue should be elevated for resolution.

- At non-NPL sites where there are negotiated agreements, disputes that cannot be mutually resolved at the field or Project Manager level also should be elevated for disposition through a tiered process set forth in the site-specific agreement.

- At non-NPL sites without a negotiated agreement, dispute processes are negotiated on a site-specific basis.

- While EPA supports consultation with regulators, DERP specifies that an enforceable agreement requirement for DoD to consult regulators prior to taking a response action involving OE "does not apply if the action is an emergency removal taken because of imminent and substantial endangerment to human health and the environment and consultation would be impracticable."[23] To the extent feasible, enforceable agreements should allow for emergency responses. Language that allows for an emergency response to a non-specified incident, with later notification and documentation to regulators, is encouraged. (For an example of such language see EPA Region III's *"Former Nansemond Ordnance Depot Site, Suffolk, Virginia, Interagency Agreement to Perform a Time Critical Removal Action for Ordnance and Explosives Safety Hazards."*)

Enforcement

When necessary, EPA will take enforcement actions against responsible parties, although attempts should be made to negotiate agreements or orders to conduct the required work prior to unilaterally issuing an order. If EPA determines that a site poses an imminent and substantial endangerment and the responsible parties disagree with EPA's determination regarding the need for schedules or response action(s), an enforcement order based on the nature of the contamination and site-specific situation would be appropriate. EPA may issue an enforcement order to compel cleanup by any or all responsible parties under an appropriate enforcement authority, including, but not limited to, CERCLA, RCRA, or the SDWA. In appropriate situations, EPA may execute a response action as needed to abate imminent and substantial and other threats and proceed with cost recovery actions.

[23] 10 U.S.C. 2705(b)(2)

DRAFT

APPENDIX

KEY TERMS THAT DEFINE SCOPE

Key Terms That Define Scope for the Purposes of these Guidelines

Operational Range: A range on which a military service is conducting training or munitions testing or may do so in the future. In general, such ranges serve only this purpose, as other uses would be incompatible with the potential explosives safety threat such ranges pose.

Non-operational Range: Refers to former military ranges that are not used and are not planned to be used in the future for military training, munitions testing, or other similar activities. Previously referred to as Closed, Transferring, or Transferred Ranges (CTT).

Other Sites: The term "other sites," as used in this document, refers to other hazardous waste sites where OE may be encountered (e.g., scrap yards, ammunition plants, DoD ammunition depots, buried munitions, open burning/open detonation (OB/OD) units, research/testing facilities, and former DoD properties).

Military munitions - Means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. The term does not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components, except that the term does include non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 2710(e)(3) and 40 CFR 260.10)

Military range - Means designated land and water areas set aside, managed, and used to research, develop, test, and evaluate military munitions, other ordnance, or weapon systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas. (40 CFR 266.201)

Munitions constituents - Means any materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 U.S.C. 2710(e)(4))

Munitions response - Means response actions, including investigation, removal actions, and remedial actions, to address the explosives safety, human health, or environmental risks

presented by unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC). (32 CFR Part 179.3, Munitions Response Site Prioritization Protocol Proposed Rule)

Munitions response area (MRA) - Means any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples are former ranges or munitions burial areas. An MRA is comprised of one or more munitions response sites. (32 CFR Part 179.3, Munitions Response Site Prioritization Protocol Proposed Rule)

Munitions response site (MRS) - Means a discrete location within an MRA that is known to require a munitions response. (32 CFR Part 179.3, Munitions Response Site Prioritization Protocol Proposed Rule)

Explosives or Munitions Emergency Response Specialist: Means an individual trained in chemical or conventional munitions or explosives handling, transportation, render-safe procedures, or destruction techniques. Explosives or munitions emergency response specialists include DoD explosive ordnance disposal (EOD) personnel, technical escort unit (TEU) personnel, and DoD-certified civilian or contractor personnel, and other Federal, State, or local government or civilian personnel similarly trained in explosives or munitions emergency responses (40 CFR Part 260.10, "Definitions").

Lead Agency: The agency that provides the OSC/RPM to plan and implement response actions under the NCP. The Lead Agency under CERCLA could be EPA, the U.S. Army Corps of Engineers or other DoD component, other Federal Agency, etc.

Ordnance and Explosives (OE): Consists of the following:

(1) Munitions, munitions components, chemical or biological warfare material or explosives that have been abandoned, expelled from demolition pits or burning pads, lost, discarded, buried, or fired. Such munitions, munitions components, and explosives are no longer under accountable record of any DoD organization or activity.
(2) Soil presenting reactivity or ignitability hazards due to the concentration of energetic materials present in the soil
(3) Buildings or structural materials contaminated with energetic material residues that present reactivity or ignitability hazards.

Unexploded Ordnance (UXO): These Guidelines will use the term "UXO" as defined in the Military Munitions Rule. "UXO means military munitions that have been primed, fused, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation personnel, or material and remain unexploded either by malfunction, design, or any other cause." This definition also

covers all ordnance-related items (e.g., low-order fragments) existing on a non-operational range. [40 CFR Part 266.201, 62 FR 6654, February 12, 1997].

Note: The final RCRA Military Munitions Rule (62 FR 6622, February 12, 1997) defines in 40 CFR 260.10 and 266.201: *active range; chemical agents and munitions; explosives or munitions emergency; explosives or munitions emergency response; explosives or munitions emergency response specialist; inactive range; military munitions; military range; and unexploded ordnance (UXO).*